NATIONAL INSTITUTES OF HEALTH
WARREN GRANT MAGNUSON CLINICAL CENTER
NURSING DEPARTMENT

PROCEDURE: Safe Handling and Disposal of Hazardous Drugs (HD) including:

I. Essential Information
II. Administration of HD (Safe Work Practices)
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IV. Safe Handling of HD Spills on hospital mattresses (ex: Intraperitoneal Chemotherapy)
V. Safe Handling of HD Spills
VI. Employee, patient, staff, or visitor accidental skin, eye, or sharp exposure to HD
VII. References

References:

NIH list of Hazardous Drugs on - line on the Clinical Center Pharmacy Department Medical Information Page:
http://www.cc.nih.gov/phar/med_info.html .

Approved:

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PROCEDURE: Safe Handling of Hazardous Drugs (HD)

I. Essential Information:

1. Studies in cooperation with The Occupational Safety and Health Administration (OSHA) indicate potential risks for health care workers who are exposed to hazardous drugs or investigational agents with unknown risks. Potential risks of HD include: genotoxicity, carcinogenicity, teratogenicity, infertility, and organ toxicity. Because of the potential risks it is the responsibility of all health care workers (HCW) and Clinical Center personnel to comply with the safety measures recommended by OSHA and other regulatory and advisory agencies in order to minimize exposure to hazardous drugs. A principle of "ALARA" or keeping exposures "**A**s **L**ow **A**s **R**easonably **A**chievable" will be followed when handling HD or investigational agents where the risks are not fully known.

2. Accessing the Pharmacy Department's "Medical Information" website, NIH personnel can obtain MSDS on – line at http://www.cc.nih.gov/phar/med_info.html. The documents may be downloaded or printed. If for some reason the website should not be available, contact the CC Pharmacy Material Safety Data Sheets (MSDS) are documents, which contain information about commercially marketed HD, including: recommendations for acute exposure treatments and health hazards after exposure to HD. In the event of an occupational exposure to a HD, staff, patients, and visitors have the right to obtain in a timely manner information about the drug which may be in the form of an MSDS in order to identify potential risks of exposure. By IV Admixtures Unit (496-6551). Persons outside the NIH who wish to obtain MSDS should contact the drug product's manufacturer or distributor.

3. Patient Care Unit personnel are recommended to refer to drug information resources which are located on their units. The Pharmacy department prepares and distributes to each Patient Care Unit DRUG FACT SHEETS for investigational study drugs used on each patient care unit. DRUG FACT SHEETS are updated whenever protocol-related drug treatments are amended and when updated pharmaceutical data becomes available for investigational compounds used at the Clinical Center. DRUG FACT SHEETS include information about adverse effects associated with hazardous agents.

4. The Clinical Center provides protective barrier equipment and practice guidelines to decrease or prevent the risk of occupational exposure to HD. Any staff who are pregnant, lactating, and staff who are trying to conceive who have concerns about exposure to HD during administration and while caring for patients receiving these agents, should discuss their concerns with their immediate supervisor. For questions about the CC Safety program relative to hazardous drugs contact the NIH CC Safety Officer.

5. HD will be prepared and properly labeled by the Pharmacy with a colored label stating:

   HAZARDOUS DRUG
   Special Handling
   If medication is not administered to patient,
   return to pharmacy for proper disposal
   DO NOT DISCARD ON UNIT

6. Storage areas for HD containers and contaminated equipment, trash, or linen need to be safely secured and labeled on the Patient Care Unit restricted to authorized personnel to prevent injury to children, patients, visitors, and staff.

7. The pre-packaged Chemotherapy spill kit is to be used by staff on the Patient Care Unit (ex: Sage ChemoSafety spill kit). Patients, when appropriate, are discharged with the home health spill kit (ex: Kendall ChemoBloc Home Health Spill kit)

II. Administration of Hazardous Drugs (Safe Work Practices)

A. Equipment List

Supplies for Routine Handling and Disposal of HD

Chemotherapy spill kit (see section III b.)
2 pairs of chemotherapy gloves (powder free Nitrile gloves-.11mm thick)
Chemotherapy gown
Splash goggles
Air purifying respirator (NIOSH 95 approved)
Spill towels (example: Chux pads)
Absorbent pads (example: Chux pads)
Sterile gauze
Tape
Covered plastic double lined Medical Pathological Waste (MPW) box
Plastic lined isolation linen bag
Sharps box
Leak proof plastic bags that can be sealed
Chemotherapy waste container/bucket

B. STEPS	KEY POINTS
1. Wash hands	
2. Don protective personal equipment such as gown, chemotherapy gloves, and splash goggles as follows:	
a. Gown-don gown and close snaps.	a. Gowns should be disposable, constructed of low permeability fabric, lint free, with a closed front (or front snaps with a protective panel), & long sleeves with elastic or knit closed cuffs.
b. Gloves- Single Gloving -If single gloving, tuck the clean glove over the cuff of the gown.	

Double Gloving -If double gloves are worn, 1 glove is inserted under the cuff and 1 glove goes over the cuff.	b. Double gloving is recommended by OSHA but is not mandatory in the event that double gloving interferes with an individual's technique. Double gloving is not usually required if using chemotherapy gloves (Nitrile .11mm thick).
c. Change gloves at least every hour.	c. Gloves should have minimal or no powder. Changing gloves hourly helps to prevent accidental exposure due to an unnoticed torn glove.
d. Put on a NIOSH 95– approved respirator mask and splash goggles for administration of HD where aerosol formation, spraying, or splashing is likely (example: if in the room with patient receiving aerosolized Pentamidine and Ribavirin).	d. NIOSH 95 respirators effectively prevent the inhalation of hazardous drug. Splash goggles effectively prevent accidental exposure to the eyes.
3. If at any time barriers are noted to be torn, punctured, or contaminated with HD, remove the damaged items, remove contaminated clothing, and wash contaminated skin.	3. Refer to section V for exposure information.
4. Separate HD from other drugs by storing HD drugs in a bin (like a bath basin) or in a cabinet with a front barrier.	4. HD need to be stored safely in patient care areas to avoid accidental dropping of the HD container.
5. Place a plastic-backed absorbent pad under the IV system to protect the patient when connecting or disconnecting the IV site to the VAD.	5. Placing a pad under the IV system when connecting or disconnecting the IV site to a VAD helps to absorb potential leakage of HD.
6. Priming IV sets with fluid when administering HD will be accomplished with one of the following techniques:	6. Priming IV sets with fluid to dispel air is associated with risks of spills and formation of aerosol. To avoid these risks, OSHA recommends using a non-drug containing compatible flush solution to prime IV sets whenever possible.
a. Pharmacy will prime IV sets for selected HD: • HD delivered by ambulatory pumps • Small volumes of HD • HD not compatible with standard flush solutions. • There should be no need to remove air from the container of HD that Pharmacy has prepared. Do not add fluids to a container of HD that Pharmacy has prepared.	a. Due to nature of some HD there will be some instances when Pharmacy will prime IV sets. Pharmacy is equipped with biosafety cabinets for this procedure. The Pharmacy Dept. will remove air from all containers which are to be administered with an ambulatory pump. Adding fluids to a container of HD causes a potential risk for formation of aerosol of HD as well as changing the chemical compound of the HD.
b. Secondary IV sets used for HD administration will be primed with a non-drug containing compatible flush solution	b. Refer to the Nursing Department procedure on medication administration: backflow technique.

using a back flow closed system technique.

c. Primary IV sets used for HD administration will first be primed with a non-drug-containing compatible flush solution. The bag of the flush solution can then be removed and discarded and replaced with the HD solution container.

c. Do not prime IV sets with HD.

d. vented/universal tubing with the vent open for glass containers and closed for non-glass containers.

d. Keep the vent closed for non-glass containers and opened for glass containers. Avoid exposure to any potential aerosol.

e. Syringes with HD should be large enough so that they are never more than three fourths full when the entire dose is present/ Do not clear air from the syringe.

e. Overfilled syringes increase the risk of accidental spills. The pharmacy will safely remove air from the syringe with HD.

7. Use sterile gauze when connecting or disconnecting HD containers to IV lines, extension tubing, etc.

7. Sterile gauze should be used around IV injection sites to contain leaks or sprays of aerosol.

8. Verify that all IV tubing connection sites are secured (Luer-Lok ® connections are tightened by hand and taped).

8. Do not tighten connections with hemostats because it causes the plastic connectors to crack and leak.

9. Observe the IV system for any leakage.

10. Dispose of any IV equipment keeping the system intact (e.g. do not disconnect IV tubing from infusion bag). Discard disposable used equipment into a chemotherapy waste bucket then close the lid. When the chemotherapy waste bucket is three fourths filled, close and secure the lid, then place the chemotherapy bucket in a covered double lined MPW box.

10. Placing contaminated IV equipment into a chemotherapy waste bucket with a secure lid & then placing it into a MPW box contains the HD and decreases the risk of formation of aerosol during handling of the trash.

11. Dispose of glass containers contaminated with HD along with the connected IV tubing by placing them into a chemotherapy waste bucket. Close the lid. When the chemotherapy waste bucket is three fourths filled, close and secure the lid, then place in a covered double lined MPW box.

11. To decrease the risks of exposure for staff, HD will be dispensed in non-glass containers except in situations where glass is the only approved container for the HD.

12. Wear double gloves and gown to clean contaminated reusable equipment. Wash equipment twice with detergent and then rinse equipment with water. Wear safety goggles and or mask if there is a risk for splashing or aerosol generation.

12. Reusable equipment such as IV pumps need to be cleaned by housekeeping staff before reuse.

13. While wearing protective equipment such as gloves and gown, dispose of linen contaminated with HD or body fluids from

patients who have received HD within the last 48 hours into an isolation linen bag with a plastic liner.

14. Remove protective barrier equipment like gowns and gloves before leaving the administration area. After use, dispose of equipment into a covered double lined MPW box then wash hands.

14. Do not reuse gloves or contaminated protective equipment. If double gloves were worn, first remove the outermost gloves, then remove gown, goggles, and mask. Remove the innermost gloves last being careful to avoid touching skin or anything with the potentially contaminated gloves. Next, wash hands.

15. Dispose of sharps contaminated with HD in a leak proof and puncture resistant container (sharps box). When the sharps box is 3/4th filled, close and place into a MPW box.

16. Any unused or partially used HD should be securely clamped, capped, and sealed in a plastic bag before sending it back to the Pharmacy.

16. HD should be transported inside sealed plastic bags. Do not use the pneumatic tube system or Mosler automatic delivery systems.

17. Provide teaching to families and significant others concerning safe handling of HD or body secretions.

17. Follow guidelines for teaching safe handling of HD as listed in the references.

18. Wear protective barriers such as double gloves when dealing with patient secretions if the patient has received a HD within the previous 48 hours. Avoid splashing when emptying bedpans or urinals. Avoid rinsing procedures that generate spraying and formation of aerosol.

18. Wear splash goggles whenever there is potential for aerosol formation.

19. Wash hands after gloves are removed.

19. Do not reuse gloves or contaminated personal protective equipment.

20. Document teaching.

III. <u>Safe Handling of Trace (less/equal to 5cc) Contamination of HD:</u>

A. Essential Information

Nursing staff are responsible for management or disposal of items contaminated with trace amounts of HD (less/equal to 5cc) clothing, linen, drips on environmental surfaces (example: beds or tables). Trace waste from HD is disposed of in the *Chemotherapy waste container/bucket, the container is closed* then placed into MPW box and is handled as medical pathological waste. Any spill of HD that exceeds 5cc is considered a spill, disposed of as Chemical waste, and managed by the fire department.

B. Equipment

Supplies for Safe Handling of Trace Contamination of HD or Chemotherapy Spills

Chemotherapy Drug Spill Kit containing:

2 pairs of latex chemotherapy gloves (powder free Nitrile gloves-.11mm thick)
Chemotherapy gowns
Splash goggles
Air purifying Respirator Mask (NIOSH 95-approved)

3 spill towels
2 absorbent pads
2 Chemotherapy waste bags and ties
Shoe coverings
Scooper device with scraper (use if glass is involved)

Detergent
Sharps box
1 Chemotherapy Waste Container/Bucket
Covered double plastic lined Medical Pathological Waste (MPW) box
Plastic lined isolation linen bag
Leak proof plastic bags that can be sealed

C. STEPS	**KEY POINTS**
1. Immediately contain the spill by placing disposable absorbent plastic-backed pad (e.g. Chux) absorbent side down over the spill.	1. Do not touch spill at this point.
2. Restrict access to the area until the cleanup is completed and remove non-essential person(s) from the area.	
3. Notify the Fire Department for any spills of HD on absorbent surfaces such as carpets.	3. The Fire Department will manage spills involving absorbent surfaces like carpets.
4. Don protective gear: two pairs of non-powdered chemotherapy gloves, chemotherapy gown, splash goggles, and if needed, shoe coverings and a NIOSH 95-approved respirator mask.	4. A NIOSH 95-approved mask is required when airborne powder or aerosol is likely to be generated.
5. Remove Chux pad and place in a chemotherapy waste bucket, close and secure the lid then place in a double plastic lined MPW box.	
6. Remove glass particles if present using a scoop device and scraper from the Chemotherapy spill kit instead of gloved hands. Place glass particles in a chemotherapy waste bucket then close the lid.	6. Using a scoop device & scraper helps to prevent sharps injury and exposure to HD.
7. Wipe the spill area with an absorbent gauze and clean spill area using disposable materials and detergent solution washing three times.	
8. Rinse the area with clean water using dampened gauze.	
9. Place contaminated materials into chemotherapy waste bucket, close and secure the lid, then place in a covered double plastic lined MPW box.	
10. Notify your Head Nurse or Service Supervisor.	

IV. Safe Handling of spills of HD on Hospital mattresses (ex: intraperitoneal chemotherapy {IPC})

A. Essential Information

1) The standard CC mattress has a factory produced cover that is vapor permeable and impervious to fluid penetration. Unless the mattress has been punctured, the fluid will pool on the surface of the cover where they can be blotted dry, washed, and rinsed.

2) IPC therapy has a potential for spills of HD mixed with body fluids due to: the connections of the system, patient wound condition (ex: wound dehiscence), and position changes of the patient from the recumbent position to sitting or standing.

3) Preventative measures for spills during IPC should help prevent or lessen the extent of any potential spill of HD and body fluids.

B. Equipment

Supplies for Safe Handling of Trace Contamination of HD or Chemotherapy Spills

Chemotherapy Drug Spill Kit containing:

- 2 pairs of chemotherapy gloves (powder free Nitrile gloves-.11mm thick)
- Chemotherapy gowns
- Splash goggles
- Air purifying Respirator Mask (NIOSH 95-approved)
- 3 spill towels
- 2 absorbent pads
- 2 Chemotherapy waste bags and ties
- Shoe coverings
- Scooper device with scraper (use if glass is involved)

Detergent

Sharps box

1 Chemotherapy Waste Container/Bucket

Covered double plastic lined Medical Pathological Waste (MPW) box

Plastic lined isolation linen bag

Leak proof plastic bags that can be sealed

C. STEPS KEY POINTS

Prior to providing care to patients at risk for a spill:

1. Prepare the environment to contain any potential spills	1. Liberally utilize protective barriers such as draw sheets, plastic lined draw sheets, & chux pads on the bed prior to initiation of administration of cytotoxic agents.
2. Check and tighten connections on patient drains, collection containers.	2. Equipment connections are a potential source of disconnection and subsequent leakage of HD.
3. Assess incision lines and wound site for integrity and risk for dehiscence.	3. Incision lines that are not well approximated or wounds that have dehisced may allow flow of body fluids along with trace amounts of HD to leak unto patient gowns, bed linens, and the mattress cover.
4. Instruct patient and family to call the nurse at the first sign of any leakage of fluids associated with the IPC	4. The earlier the spill is recognized the greater the potential for containment of the fluids and the opportunity to minimize the impact of the spill on the patient,

	environment, and others.
5. Once any spill associated with IPC has occurred: a. Don protective equipment such as double chemotherapy gloves, gown, & splash goggles. b. Determine the source of the spill and attempt to stop the flow of liquids (ex: clamp any disconnected tubing) c. Assist the patient in immediate care including placing absorbent pads such as sterile gauze or Chux over any wet skin areas. d. Remove any wet linens or clothing and place in plastic lined bags in linen bag e. Follow the instructions in this procedure for the safe handling of spills in section VI.	
6. With patient out of bed and with protective equipment on inspect mattress cover for any obvious perforations	
7. For mattress covers without any obvious perforations, blot any wet areas on the mattress with absorbent pad such as Chux	
8. Wash any affected areas X 3 with detergent solution	
9. Rinse the affected area of the mattress cover with clean water using dampened guaze.	
10. Place contaminated materials into chemotherapy waste bucket, close and secure the lid, then place in a covered double plastic lined MPW box.	
11. Notify the Head Nurse or Service Supervisor.	
12. Once the mattress cover has dried the patient may be returned to the bed.	
13. In the event of a spill of HD/body fluids to a perforated mattress cover, complete steps 5-12 as above.	
14. Once the mattress cover has dried, notify housekeeping to remove bed for inner mattress inspection.	14. A perforated mattress cover allows contamination of the inner mattress. This complication cannot be safely managed on the patient care unit.

V. Safe Handling of HD Spills (> 5 mL)

A. Equipment (same as in section III B above)

B. STEPS	KEY POINTS
1. Immediately cover the area by placing a plastic backed absorbent pad such as a Chux, absorbent side down, over the spill.	
2. Remove non-essential person(s) from the room.	
3. Isolate contaminated person(s) to minimize the spread of contamination (example: use a bathroom to isolate the person).	3. Remove any contaminated clothing & follow steps for skin exposure in section V below. Obtain & review the HD MSDS.
4. Close doors and notify the NIH Fire Department (6-2372). Report the following: • Location of the spill • Name of HD spilled • Approximate volume of the spill • Interventions taken	4. The Fire Department will respond and clean the spill.
5. Notify the Head Nurse or Service Supervisor.	

VI. Employee, Patient, and Visitor: Accidental Skin, Eye, or Sharp Exposure to HD

A. Equipment

- Soap and Water
- Saline solution (Room temperature: 1 liter of 0.9 % Sodium Chloride Injection or Irrigation Normal Saline or tap water)
- IV tubing to be used for the eye irrigation
- Covered double plastic lined MPW box
- 2 pairs of powder free chemotherapy gloves/Nitrile gloves
- Leak proof plastic bags that can be sealed
- 3-4 plastic backed pads (example: Chux)
- Chemotherapy gowns
- Splash goggles
- Plastic lined isolation linen bag

B. STEPS	KEY POINTS
1. <u>For staff</u>: Remove contaminated gown and gloves and place in leak proof plastic bag, seal, then place in MPW box. <u>For patients and visitors</u>: Remove contaminated clothing and place in plastic bag and seal.	1. Contaminated clothing & linen should be washed separately to avoid contamination of other clothes. They can then be washed a second time in the regular laundry.
2. Immediately wash the affected areas:	2.
a. Skin areas should be washed with soap and copious amounts of water for at least 10 minutes. Do not use a scrub brush.	a. Scrub brushes may tear the skin and worsen the exposure.
b. For eye exposures, have the individual lie down, place absorbent pads under the head and chin, have a staff member assist by keeping the affected eye open, then	b. Assistance from a second person may be needed to adequately irrigate the eyes of the affected individual. Both staff members should wear gowns, gloves, and

gently irrigate the eye for at least 15 minutes with copious amounts of water or isotonic eye wash, 0.9% Sodium Chloride irrigation or injection.

c. For mucus membranes such as the mouth, instruct the individual not to swallow and flush the mouth with copious amounts of tepid water.

3. After initial treatment measures are taken for employees, patients, or visitors, send employees to the Occupational Medical Services for medical examination and treatment. For visitor HD emergencies requiring more than initial treatment measures call the NIH Fire Department and the Service Supervisor.
4. Notify the Head Nurse or Service Supervisor for all exposures to HD. Notify the primary care physician if the patient is exposed.

goggles.

3. If OMS is closed, the on-call physician and the Service Supervisor will determine if the exposure warrants an immediate visit to Suburban Hospital's Emergency Room or if the employee can postpone reporting the exposure until OMS reopens. Obtain & review the MSDS.

C. Documentation

NA

VII. References:

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7. National Institute of Occupational Safety and Health. Hazard Communication, Toxic and Hazardous Substances 1910.1200, Communication May, 1997
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9. NIH Nursing Department Procedure: Care and Maintenance of Central Venous Access Devices (VAD) to Include: Percutaneous VAD, Subcutaneous VAD "Ports", Tunneled VAD "Hickman, Broviac, and Groshong", Peripherally Inserted VAD "PICC and Groshong PICC" 6/95
10. NIH Nursing Department Procedure, Inpatient Administration of Medications, February 1997.
11. U.S. Department of Labor Occupational Safety and Health Administration Hazard Communication Standard (HCS) {29 CFR 1910.1200})
12. U.S. Department of Labor Occupational Safety and Health Administration HCS Interpretation, "Hazard Communication Standard and Pharmaceuticals," 01/03/1994.
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